

In the Claims

1. (Original) A process for reducing the sulfur content of naphtha in the effluent from a fluid catalytic cracking reactor during treatment in a catalytic distillation fractionation column, the process comprising:

- a. drawing from the fractionation column a stream of high-sulfur hydrocarbons, full-range catalytic cracked naphtha and light cycle oil fraction boiling in the range C. sub. 5 to 500°F.
- b. introducing the high-sulfur hydrocarbon and naphtha stream into a reactive distillation side column for hydrodesulfurizing;
- c. introducing hydrogen into the side column;
- d. operating the side column to desulfurize the high-sulfur hydrocarbons and provide a low-sulfur content naphtha;
- e. separating and withdrawing a low-sulfur content naphtha fraction C. sub. 5 to 430. degree. F. boiling range from the side column;
- f. returning the low-sulfur content naphtha to the fractionation column; and
- g. recovering the low-sulfur content naphtha from an overhead stream withdrawn from the fractionation column.

2. (Original) The process of claim 1, wherein the recovered low-sulfur content naphtha contains 200 ppm or less of sulfur.

3. (Original) The process of claim 1, wherein the recovered low sulfur content naphtha contains not more than 30 ppm of sulfur.

4. (Original) The process of claim 1, wherein the recovered low sulfur content naphtha contains sulfur in the range from 30 ppm to 200 ppm.

5. (Currently amended) The process of claim 1, wherein the high-sulfur[(-)]hydrocarbons include compounds selected from the group consisting of mercaptans, sulfides, disulfides, thiophenes, benzothiophenes, and thiophenic and benzothiophenic compounds.

6. (Currently amended) The process of claim 1 which further includes withdrawing a +430° F heavy catalytic cracked naphtha stream from the bottom of the side column and returning it to the fractionation column.

7. (Original) The process of claim 1, wherein the low-sulfur content naphtha is returned to the fractionation column in the form of a first stream comprising light and medium catalytic cracked naphtha and a second stream comprising heavy catalytic cracked naphtha.

8. (Original) The process of claim 7 which further includes withdrawing a portion of the second stream as a separate heavy catalytic naphtha product stream.

9. (Original) The process of claim 7 which further includes returning a vapor portion of the second heavy catalytic cracked naphtha stream to the side column above the take-off of the second stream.

10. (Original) The process of claim 1 which further includes separating and removing from the fractionation column a heavy cycle oil product stream and a light cycle oil product stream.

11. (Original) The process of claim 10, wherein the side column bottom stream is returned above the take-off position of the light cycle oil stream.

12. (Original) The process of claim 1, wherein the side column includes plates and trays and said trays contain a hydrodesulfurization catalyst.

13. (Original) The process of claim 1, wherein the hydrogen is introduced into the side

column in at least two locations.

14. (Original) The process of claim 13, wherein at least one hydrogen stream is introduced below and one hydrogen stream is introduced above the position of the introduction of the high-sulfur catalytic naphtha stream.

15. (Original) The process of claim 7, wherein at least a portion of the overheads from the side column that are returned to the fractionation column comprise low-sulfur light and mid-cut naphtha.